DS-SHD-SE-01

Development set IQRF Multifunctional Sensor

Hardware v1.03

Brief User's Manual

See DS-SHD-SE-01 User's guide for details.

DS-SHD-SE-01 is a development set for IQRF multifunctional wireless sensor SHD-SE-01. This set is intended for development of user-specific application and SHD-SE-01 itself for final implementation.

Electrical specifications	***Typical values** unless otherwise stated*
Parameters specified in this datasheet are typical values fo power supply 3 V only.	
Battery	$LiMnO_2$ CP502441, 3 V, 1200 mAh (primary cell)
Operating temperature	-30 °C to +60 °C
Supply current	
Sleep mode (all functionality disabled)	380 nA
Run mode (MCU running, RF IC disabled)	1 mA
Additional supply current	Refer to datasheets of respective ICs
RX mode	3 mA (STD mode), 330 µA (LP mode), 25 µA (XLP mode)
TX mode	14 mA – 24 mA (according to RF output power)
Nominal frequency	868.35 MHz or 916.50 MHz (software selectable)
RF sensitivity	-104 dBm (868 MHz), -102 dBm (916 MHz)
RF output power	Programmable in 8 levels (0 – 7), -12.5 dBm to 5 dBm (-2.5 dBm/level)
RF range	Up to 380 m (strongly depends on device orientation and surroundings)
EEPROM	16 Kb, serial interface I2C, 1 000 000 erase / write cycles typ.
Storage temperature	0 °C to +30 °C

Hardware

SHD-SE-01 is a generic equipment, i.e. the hardware is fixed and specific functionality (communication with individual peripherals, their control and readout) can be achived by application software for internal MCU only.

Power supply
SHD-SE-01 is supplied from built-in non-removable primary battery. DS-SHD-SE-01 is delivered with the battery soldered but power supply disconnected by the jumper for development purpose. Energy consumption should be minimized by software techniques.

TR module
The RF circuitry is compatible with IQRF smart transceiver TR-54DA. Application SW should be uploaded to MCU via RFPGM (wireless) interface.

Peripherals
G-sensor (accelerometer), real time clock/calendar (RTCC), temperature sensor, illumination sensor, EEPROM memory, pushbutton and LED are available.

Case
The plastic case can not be repeatedly disassembled.

Software

SHD-SE-01 in this development set is delivered with Demo software illustrating functionality of all on-board sensors. It uses the IQRF OS operating system only, without HWP and DPA.

The demo acquires data from all sensors and sends it via RF. This data can be received by another IQRF TR module. If the receiving device has USB connectivity (e.g. the GW-USB-05 gateway or CK-USB-04 kit with TR-52DA module plugged), the received data can be displayed on PC screen by the Terminal of IQRF IDE development environment. The E03-TR example should be uploaded in the receiving TR module.

Source files of Demo in C language are available. Functionality including power management and packet format are described in comments.

The Demo can be modified according to specific needs. Refer to IQRF Startup package (first of all documents the IQRF Quickstart guide, IQRF OS User's guide, IQRF OS Reference guide and IQRF Basic examples).

Application program should be uploaded in MCU via wireless RFPGM programming. See IQRF OS User's guide, Appendix 3 – RFPGM. Demo application has switching to RFPGM mode after reset enabled. Thus, the device is always set in RFPGM after power on (by connecting the jumper). Take into consideration that the green LED is not implemented that is why RFPGM mode is indicated by red LED only (short flashes in 2 s period). RFPGM mode can be cancelled by the pushbutton pressed for ~1 s.

Warning

Avoid using the following operations otherwise you would be unable to wirelessly change the application program any more.

- `disableRFPGM()` *function.*
- `setupRFPGM(x)` *function called with parameter* x *having bit 4 (RFPGM enable) cleared.*

For detailed information about the DS-SHD-SE-01 functionality refer to the User's guide.

Pack list

• SHD-SE-01		IQRF multifunctional sensor, without fuse F1, with opened case, Demo SW uploaded
• Battery		Soldered, disconnected by the jumper (placed instead of the fuse)
• USB Flash stick		SW and documentation
• \Datasheets	PDF	Datasheets of key components
• UG_ DS-SHD-SE-01	PDF	User's guide
• SW_DS-SHD-SE-01	ZIP	Demo SW
• IQRF-Startup-Package	ZIP	Complete package to start with IQRF

MICRORISC s.r.o., Prumyslova 1275, 506 01 Jicin, Czech Republic, EU
Tel: +420 493 538 125, Fax: +420 493 538 126, www.microrisc.com
web: www.iqrf.org, e-mail: sales@iqrf.org, on-line support: support@iqrf.org

Smarter wireless. Simply.